THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

VOL. XV. SEPTEMBER, 1898. NO. 9.

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF KERATOCONUS.[1]

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SOME years ago I began a study of this congenital deformity of the cornea, together with a search of the best surgical intervention for those cases of double keratoconus in which all other methods of treatment as well as optical aid, afforded unsatisfactory or no relief. In the selection of cases, care was exercised to include only typical examples of this uncommon affection, in which there was little or no question concerning the congenital origin.

Those cases in which this was in doubt, or if it could be assumed that antecedent disease of the cornea, conjunctiva or other structures had existed, were excluded.

I soon shared in the common experience that the various and vaunted methods of treatment and relief other than surgical were found wanting. Relief, such as could be afforded, was brought about mainly through the aid of corrective lenses, with or without stenopæic appliances. This led to a more careful study of the various surgical methods. Before offering conclusions gained from the clinical study of eleven cases and surgical experience in five of this number, it must be affirmed that surgical intervention was advised and practiced only as a last necessary resort.

[1]Synopsis of paper read before the American Ophthalmological Society, July, 1898.

Keratoconus is, like the higher degrees of myopia and keratoglobus, a congenital deformity. It affects the central region of the cornea and in most instances both eyes.

It may remain stationary for life. In a certain proportion of cases there occurs a tendency to progressive increase of this conical deformity. In some instances this is arrested spontaneously and leaves the patient a fraction of available vision. In others it continues until the eyes for all practical purposes are useless. This last and smaller contingent is the one for which surgical treatment may become a justifiable and necessary venture.

This tendency to progression develops in most instances between the twelfth and twenty-fourth year; although exceptionally it may occur as late as the thirtieth year.

Sex appears to play a significant rôle; of eleven cases under observation only two were males.

A disturbed state of the general health and nutrition appears if it is present, to be rather a complication than a direct cause for this mysterious advance of the deformity which is observed in some cases. But without assuming latent local causes which antedate the general ones, the former can not be held responsible; that they influence unfavorably a progression once begun is certain.

It differs from congenital myopia, buphthalmus, keratoglobus, in that the internal structures even during the period of progression are not implicated; in fact, the opposite statement is uphe d by the cases under my observation, that these structures remain healthy and complications such as occur in keratoglobus and myopia, unless the conical state of the cornea is associated with the latter, are not met with.

Clinically, it resembles most keratoglobus, but distinctive differences separate it from this even more unfortunate malformation. Keratoglobus is recognized more readily because of the more striking deformity, and it is also in most instances associated with abnormal dimensions of the globe, thinness and discoloration of the sclera. Later it becomes even more conspicuous on account of pathological changes which invade such eyes and terminate in optic nerve atrophy and excavation, glaucoma, hydrophthalmus, etc. Complaints due to defective and disordered sight and statements reciting ineffectual attempts to secure better vision through the aid of lenses oc-

cur generally before the tenth year, and the graver complications of glaucoma, optic nerve atrophy, etc., after the thirtieth year. With keratoconus this is different. The real malformation of the cornea is often not recognized before the tenth year, and in some cases it is discovered only after unmistakable progression with increasing failure of sight have come about. It is during the period following puberty or before the twenty-fourth year that this comes about. During this time functional distress of the eyes may be pronounced and persistent, but serious complications of the optic nerve and glaucoma such as happen in the allied affections of keratoglobus, etc., are not observed.

The surgical treatment of keratoconus to secure an arrest of the increasing deformity and for the possible betterment of sight, is, in every instance in which it can be considered, a justifiable intervention, but beset with dangers and difficulties.

It is always a tedious undertaking. My experience included either a partial abscision of the prominent cone, the excision of narrow wedge-shaped pieces of tissue from its apex, or the placing of a number of intersecting linear excisions of tissue, through this prominent region without penetrating the thickness of the cornea.

After subsequent cicatrization, this region, which it was hoped had gained tissue firmness and resistance, was tatooed.

An iridectomy preceded, in all my operations except one, the interference undertaken to reduce by cicatricial contraction the ectasia of the central region of the cornea.

In one case I found it expedient to supplement the operations on the cornea and iris by the removal of the lens, as the case was complicated with excessive myopia.

Cauterization of the apex with actual or galvano-cautery, even with every precautian that it be superficial, I found fraught with greater risks and dangers.

Tapping of the anterior chamber in order to secure a firmer contraction at the seat of excision is, in my opinion, an unwise supplementary procedure. That greater dangers attend surgical interference in this region is probably due mainly to the extreme vulnerability of the central region of the cornea to traumatism of every kind and degree.

In a deformed or conical cornea with its nutrition precarious in consequence of its greater thinness and distortion of its

tissue, this danger appears increased and even that inflicted by the simplest surgical procedure is violently resented.

Operative interference should not be resorted to in one eye which is hopelessly defective if the fellow eye still retains V.=0.2 or 0.3, even if it can be established that the deformity in the best eye is slowly progressive.

It is only when vision is reduced in both eyes to less than 0.1 and lenses and stenopæic appliances are discarded as useless and the patient helpless in consequence of the blindness, that it should be advised or practiced.

CASE I.—In this patient, a young woman, Miss Eloise K., aged 19 years, useful vision was restored in both eyes. Until surgical interference was resorted to, she was helpless and her sight reduced to $^{5}/_{cc}$ in the right eye and $^{6}/_{cc}$ in the left eye. Formerly lenses had afforded better vision, but these as well as stenopæic devices became useless and were discarded. She had been under my observation for two years, and during this time every available method of treatment—general, local, eserine, compress bandage, absolute rest, repeated adjustment of lenses, stenopæic appliances, were faithfully tried, only to be abandoned as useless. The history conclusively upheld the congenital origin. At the age of 12, lenses were given her, which brought the sight of her best eye (left) to 0.4 and right to 0.3. She was enabled with much difficulty to complete her education. During the last two years, however, vision commenced to fail rapidly, and with a visible increase in the pellucid staphyloma in both eyes. The only complaint was the confusion which light produced, nor was there any evidence on the part of the internal structures which might suggest any other disturbance except the visible one of progressive increase of the central ectactic area of the cornea. The patient's health about this time showed evidences of a serious breakdown; she was anæmic and it was feared that a tubercular tendency was about to manifest itself. A change of locality brought with it no improvement in the general health, but she returned for advice more concerned than ever about the increasing failure of sight. She was no longer able to read the largest type, and she could not move about without an attendant. There was also a marked increase of the pellucid ectasia of the cornea. In spite of the disturbed state of her health, surgical interference was advised as an imperative necessity.

The most imperfect, right eye, was selected and a small iridectomy performed downwards and inwards; after an interval of several weeks, abscision of the prominent apex of the conical protuberance of the cornea without penetrating the thickness, was performed. Subsequently this region was tattooed.

One year afterwards, vision with corrective lenses was 0.4. A decided improvement having taken place in her general health, the left eye was prepared for operation. The only modification being that the apex was not abscised, but instead a small wedge-shaped piece of cornea was excised horizontally and a similar piece at right angles to it vertically. The anterior chamber was not opened. This eye resented the traumatism inflicted by the operator, and for several months remained irritable, and it was necessary to defer tatooing until fourteen months after the operation.

The final outcome of this case was satisfactory. The patient was examined recently, almost fourteen years after the first operation, and vision was found with corrective lenses to be 0.6 in the right, which had always been her most defective eye, and 0.4 in the left. She has been able, during the last few years, to read and use her eyes with comfort and without much fatigue.

In contrast to the favorable outcome of this case, I mention briefly my last experience with the surgical treatment of keratoconus.

Miss S., aged 20 years, Bellefontaine Ohio, consulted me first about four years ago. She was in excellent health. She had never enjoyed perfect vision, either for distance or close range. She was, in common with other members of her family, considered short sighted, and had worn glasses, but as she herself stated, had never derived from their use the benefit she expected and should have. I found what others had discovered before me, well-marked conical deformity of the cornea, occupying the central and adjacent regions in both eyes. In her most defective eye (right) vision was 0.1, but little or not at all benefited by lenses. The vision of the left eye was 0.3. She could, with this eye, read ordinary print, but every prolonged effort was attended with annoyance. In every other respect both eyes were found healthy.

The rapid decline of vision in both eyes and imperfect aid from lenses in her best eye, and the practically hopeless state

of the right one, led me to suggest an attempt to improve this hopelessly defective eye.

The operation proposed consisted of the placing of a series of intersecting linear excisions of tissue through the prominent area of the cornea, followed later by a small iridectomy and tattooage of the corneal scars. In order to test the susceptibility of the cornea to traumatism, I determined, as an exploratory venture, to excise a single narrow strip of tissue, just above the center, which appeared most prominent, parallel to the horizontal diameter of the prominent cone. The anterior chamber was then opened through the wound made. For forty-eight hours the eyes remained bandaged, only the outer dressing was removed and there was no complaint whatever. After this, or on the third day, there was precipitated with incredible rapidity and intensity a reaction which foreshadowed only the hopeless ruin of the eye. Complete sphacelation of the cornea was followed by panophthalmitis and orbital abscess. She opposed enucleation at first, but finally consented, and the eye, filled and surrounded by pus, was removed, only to be followed by cicatricial contractions in the cavity of the orbit.

This was certainly an unhappy termination and depressing disappointment. Every possible caution had been exercised, the operations performed with the least traumatism possible, amidst the most favorable surroundings and the most stringent asepsis. Cocaine was instilled but once. The patient was in excellent health; in fact, everything appeared as favorable as could be wished or desired.

SOCIETY PROCEEDINGS.

THIRD ANNUAL MEETING OF THE WESTERN OPHTHALMOLOGICAL, OTOLOGICAL, LARYNGOLOGICAL AND RHINOLOGICAL ASSOCIATION.

[CONTINUED.]

A Peculiar Case of Paralysis of the Ocular Muscles.

Dr. Thomas Faith (Chicago).—John N., bricklayer, aged 51 years, unmarried, nationality, Belgian. Family history, had four brothers and one sister. First child, boy, living; second child, boy, died in infancy; third child, patient; fourth child, boy, still born; fifth child, girl, died at the age of 5 years of cholera; sixth child, boy, died at the age of 2 years of convulsions. Father died at the age of 33 years of cholera. Mother died at the age of 66 years suddenly, cause unknown.

Previous history, when 9 years old, patient had epidemic dysentery; malaria at the age of 30. He had gonorrhœa at the age of 14; has had enlarged glands in the groin at times. Indefinite history of some skin trouble which occurred several times, but disappeared always on taking a brisk cathartic. Had a sunstroke in 1894, which has incapacitated him for hard work, particularly in warm weather.

History of eye trouble, has central leucoma of both corneæ, which has been present since the patient can remember. Has had a tendency to divergence in the right eye for the last seven or eight years, which has grown gradually more marked since 1894, the time of the sunstroke, up to 1896, since which time it has remained stationary. Patient has some evidence of having had syphilis—namely, some cervical adenitis, and what appears to be the remains of a mucous patch in the mouth.

Present condition, is, as you can see, paralysis of the internal rectus, superior rectus, inferior rectus, and superior oblique of the right eye. The eye remains, when at rest, in a position of divergence. If directed to look to the left the eye

can only be brought inward as far as the median line. Comparing it with its fellow of the opposite side and directing the patient to look dowdward, it is seen to fall behind. The same is true when he is directed to look down and to the right, but when he is directed to look up, instead of the eye moving directly upward, it moves up and to the right, which is easily done when the patient is directed to look in that direction, showing that the inferior oblique and external rectus are the only muscles which are acting.

The lesion causing the paralysis in this case is difficult, if not impossible to locate. In reviewing the nerve supply of the affected muscles we find the origin of the third nerve is apparently from the inner surface of the crus cerebri, and immediately in front of the pons Varolii. The deep origin is traced to a nucleus on each side of the median line in the floor of the aqueduct of Sylvius, beneath the corpora quadragemina. This nerve pierces the dura mater below the posterior clinoid process, passes along the outer wall of the cavernous sinus and divides into two branches which enter the orbit through the sphenoidal fissure between the two heads of the external rectus muscle. The superior division supplies the superior rectus and levator palpebræ, the inferior division divides into three branches—one goes to the internal rectus, the second to the inferior rectus, and the third and largest of the three, to the inferior oblique. This also sends a branch to the ophthalmic ganglion, forming its motor root. The branches of distribution of the ganglion or the short ciliary nerves supply the ciliary muscle and iris.

The fourth nerve, which supplies the superior oblique muscle, arises from a nucleus in the floor of the aqueduct of Sylvius below the origin of the third nerve. It pierces the dura near the posterior clinoid process, passes along the third nerve and enters the orbit through the sphenoidal fissure, and is the highest of the nerves passing through the orbit.

In the case under consideration we have the fourth nerve involved, the branch of the superior division of the third, which supplies the superior rectus, and the branches of the inferior division, which supply the internal and inferior recti, the third branch, or that going to the inferior oblique and ophthalmic ganglion, being unaffected. It does not seem probably for it to be a central lesion, from the fact that we have no paralysis

the inferior oblique, no paralysis of accommodation, no dilatation of the pupil and no ptosis, though Meyer states that if the cause is situated in the central parts or near the origin of the nerve, the disease must be very extensive to involve all the fibers of the nerve, and paralysis of the fourth being present in the case favors the theory of central origin.

The case in hand may be one of beginning chronic ophthalmoplegia, which is characterized by a loss of power in one or more eye muscles, which gradually increases and involves other muscles until it may be that every muscle is paralyzed. This disease may be either symmetrical or unilateral; nor are all the muscles always paralyzed. Double vision is present early, but later disappears. The levators may be partially paralyzed or wholly unaffected. The disease is essentially chronic and may last for years. If the intra-ocular muscles escape it is considered by some as strong evidence that the trouble is nuclear, but according to Mauthner, it is not a characteristic sign. Siemerling concludes that nuclear disease may be inferred from external ophthalmoplegia. Chronic ophthalmoplegia may be congenital, hereditary, may occur with constitutional syphilis, and may follow injuries. It is often associated with other affections of the nervous system, especially locomotor ataxia and progressive paralysis of the insane, and is more common in males than in females.

The above points would tend to indicate that this case is one of chronic ophthalmoplegia of central origin, though the lesion may be a peripheral one, and I have thought of the possibility of it being due to some periosteal inflammation, growth or gumma along the inner wall of the orbit, near the apex, and causing pressure upon or involving the four muscles which pass nearer to the inner than to any other wall of the orbit, and are the muscles which are here involved. Whatever may be the location of the lesion the paralysis is surely a peculiar one, and is probably due to syphilis, as I think I have obtained some benefit from the use of iodides.

DISCUSSION.

DR. ROBERT TILLEY (Chicago).—This man informs us that he was perfectly well before he sustained two accidents, one in the front of the head and one on the back part of the head.

The injury in the back part of the head, as he describes it, seems to be situated in what is supposed to be the cortical region for vision, and there is a marked depression in the skull. It is always interesting to try and find out, if possible, something regarding these injuries. I have seen so many cases where atrophy of the optic nerve has followed injuries about the head. I recall one case that came under my observation during the time of the World's Fair, and Dr. Pinckard saw it with me. The man was blind in one eye, and with the other he could see fairly well. Dr. Pinckard at the time said it was a beautiful illustration of atrophy of the optic nerve. It is unfortunate that in this case we can not get a good view of the fundus. There is undoubtedly the appearance of atrophy in the left eye on the temporal side.

Non-Pigmented Sarcoma of the Choroid.

Dr. Cassius D. Wescott.—In August, 1896, Goldie C., aged 4 years, of Madison, Wis., was referred to me by Dr. H. B. Favill, of this city, with the following history: After an attack of measles, when two and a half years old, it was noticed that she could not see with the left eye, and "something white" could be seen in it. The child had made no complaint of pain until a short time before being brought to me, and her general health seemed to be quite perfect. She had been under the treatment of a specialist in Madison for a year, but the nature of the treatment I could not learn, except that "drops" were put into the eye.

On examination I found the right eye quite normal in every way. The left eyeball was evidently larger than its fellow, but the lids were normal. The conjunctiva was not inflamed, but it was slightly œdematous, and the sub-conjunctival vessels, especially the veins, were fuller than normal. The cornea was normal, but the pupil was fully dilated and the iris pushed forward by the lens, which was almost in contact with the cornea. There was a yellowish reflex from the pupil as the eye was examined in an ordinary light, and the tension of the eyeball was + 2. No pain was complained of at the time of the examination. My diagnosis was intra-ocular tumor, probably glioma of the retina, and I advised immediate enucleation, which was consented to.

The operation wound healed promptly and kindly, and the patient returned to her home in a few days. Upon making a section of the eyeball, after hardening in formalin, the tumor was found apparently springing from the choroid in the region of the optic nerve-head, as shown in the specimen. It extended forward to the posterior surface of the lens, separating to some extent the choroid from the sclera, apparently infiltrating the choroid and retina in places as far forward as the ora serrata.

Microscopical examination of a section of the eye showed the tumor to be a small round-celled sarcoma, springing from the deeper layers of the choroid and infiltrating the retina and optic nerve. A section of the optic nerve at the point of amputation showed that the tumor-cells had infiltrated the substances of the nerve beyond that point, and I therefore expected that the tumor would return.

In May, 1897, the patient was again brought to me, when I found the orbit occupied by a new growth which nearly filled the cavity. It was immediately removed by complete exenteration of the orbit. Healing was prompt and uneventful, but in August of the same year the growth had again returned. I advised against further operative procedure, and suggested a trial of the erysipelas toxins, which was made by my friend, Dr. Van Hook, at the German Hospital. Although the usual reaction was promptly obtained and the injections were repeated quite a number of times, the treatment was without avail and the patient died December 27, 1897, with symptoms of brain tumor. No autopsy could be obtained.

This case is of interest chiefly because of the rarity of this form of tumor as compared with glioma of the retina, with which I supposed I had to deal But the practical feature of the case is the lesson which it points, that early extirpation must be insisted upon in all cases of intra-ocular tumor, if we would save life. Another practical point which I should not fail to point out in reference to this particular case is this, that I encountered so much difficulty in removing the large eyeball without canthotomy that I did not secure as much of the optic nerve as I should, and I shall always reproach myself with the thought that, had I introduced forceps and drawn out the stump of the optic nerve and amputated at the very apex of the orbit, I might possibly have prevented the recurrence of the tumor. I was perhaps deterred from doing this at the time

because of the hæmorrhage was so considerable as to give me quite a little trouble, and the child was taking the anæsthetic badly.

Primary Carcinoma of the Conjunctiva.

In February of this year, Joseph C., of Lighthouse, Ill., a farmer by occupation, aged 64 years, was referred to me for operation by my friend, Dr. Holmes. He gave the following history:

The patient has always been a hard working man, but enjoyed good health until within the last year or so, since which time he has been rather feeble and somewhat demented. Five or six years ago a small tumor was removed from his face which was called a cancer. Between two and three years ago the present trouble began as a spot of redness upon the upper and outer part of the eyeball. The spot soon assumed the form of a pimple, and continued to grow much more rapidly during the last few months.

Upon examination the right eye was found to be normal; the lids of the left eye were normal, but it was impossible to close them because of the presence of a somewhat lobulated tumor, projecting over the cornea. The eye and tumor were bathed in a muco-purulent discharge, and the apex of the tumor was apparently beginning to slough. The tumor was unpigmented and covered by a thin, membranous, transparent capsule, beneath which a few large vessels were easily seen.

Immediate enucleation was advised, and consented to. The operation was performed without difficulty, but was very bloody. The retro-bulbar conjunctiva above was involved in the tumor and was removed. The tumor was otherwise limited to the globe, and no secondary growth was found in the orbit, and the neighboring glands did not seem to be involved. The operation wound healed kindly in spite of the infection of the conjunctiva, and the patient returned to his home in a few days.

Upon examination of the specimen the eyeball seemed to be normal and the cornea clear, the tumor evidently growing from the conjunctiva upward and outward from the limbus. At the thickest point the tumor was 1 c.m. in thickness, somewhat oval in shape, perhaps 2 c.m wide, and $2^1/_2$ c.m. long. A section of the eyeball shows that the eye was practically normal. Microscopical examination of the tumor was made by my

friend, Professor Ludwig Hektoen, Director of the laboratories at Rush Medical College. His report is as follows:

"The eye comes bisected, each half in a separate bottle of glycerine (66 per cent.). The interior of the eye seems normal, also the optic nerve.

"The right antero-lateral quadrant of the globe is covered by an oval, concavo-convex growth which appears to spring from the conjunctiva, to which it is attached throughout. The sclera and the cornea under the tumor are intact.

"The tumor overlaps the cornea to beyond the middle line, but there is no marked organic connection between the two. The tumor is 8 m.m. thick, its longest diameters 2 5 and 2 c.m. Its margins are rounded, in places a little lobulated. On the cut surfaces it presents a grayish-white, almost homogeneous appearance; a few small blood vessels are recognizable.

"One-half was mounted in formalin-gelatin. From the other half pieces were taken, hardened in alcohol, imbedded in paraffin and stained in various ways.

"Microscopical examination shows that the tumor springs from the epithelium of the scleral conjunctiva. The sub-conjunctival tissue, the sclera and the cornea are intact. The tumor consists of huge branching masses and columns of epithelial cells, separated by a vascular fibrous tissue in which there is an abundant round-cell infiltration and a few hæmorrhages.

"The epithelial cells are in the main large and flat; at the periphery of the masses the cells at times assume a short columnal outline. The nuclei often lie in vacuoles in the clear protoplasm, which may have a narrow, dense hyaline border. A few atypical horny masses are met with.

"The diagnosis is carcinoma of the scleral conjunctiva."

Multiple Lymphoid Tumors of the Orbits.

The next case which I have to report is to me extremely interesting, and I regret very much my inability to present a more complete history.

The patient was a man, aged about 50 years, a grocer by occupation, who consulted me because of failing sight in consequence of tumors about the eyeballs, which had been steadily increasing in size and number for some months, during which time he had also failed in general health and had lost over 50 pounds in weight.

Upon examination I found that the lids of both eyes were normal, except that they were bulged forward owing to the presence of firm and somewhat nodular tumors beneath them. The cornea and iris were normal in both eyes and the media clear, and when the lids were raised by the fingers vision was good, but the presence of the tumors made it impossible for the patient to raise either of the upper lids fully above the pupils. The conjunctiva was not inflamed, but its vessels, especially the veins, were much fulled and larger than normal.

The diagnosis of multiple sarcoma was made and concurred in by my friend, Professor F. C. Hotz, and the patient advised that operation was not feasible. His son was informed that the patient would probably live a comparatively short time, as it was reasonable to suppose that similar malignant tumors probably existed in some of the internal organs.

The patient returned to his home in Michigan, but after three months I was much surprised to see him again, this time almost unable to get about because of the closure of the lids, and insisting that I operate, even if I could give him sight for only a few weeks. After explaining again the probable malignant nature of the disease, and his acceptance of the situation, I succeeded in removing the tumors which I now show you, and two or three others which have been given to my friends for pathological examination. The largest of the number was removed from the upper and outer portion of the right orbit, through an incision over $1^1/_2$ inches long, through the lid just below the brow. All of the other tumors were removed through the conjunctiva, and I can assure you that the dissection was a tedious one. But it was completed without accident and the wounds healed kindly. The tumors have remained in alcohol for four years and are much shrunken. They varied in size when fresh from that of a small dried pea to the first joint of my thumb.

The patient was rejoiced at being able to see again without difficulty, and soon returned to his home. He lived a year and a half, and died from progressive anæmia, without having any return of the tumors.

Microscopical examination of one of the tumors, made a few days after the operation, seemed to confirm our first opinion, that the tumors were sarcomata. However, as the patient continued to live on without return of the growth, the patholo-

gist changed his verdict, and I shall pronounce the tumors lymphomata. As you all know, similar cases have been reported by Dock, of Ann Arbor, in the *American Journal of the Medical Sciences.*

SUB-CONJUNCTIVAL DISLOCATION OF THE CRYSTALLINE LENS.

The last specimen which I have to present is remarkable as a curiosity. I have already reported the case in the second volume of the *Annals of Ophthalmology.*

The patient was a farmer, and, upon presenting himself, stated that five days before, while attending to his cattle, a young cow had hooked him in the eye. His family physician had told him that the eye was destroyed, and sent him to the city for its removal.

Upon examination a large, ragged wound was seen in the sclera, below and a little to the nasal side of the cornea. The anterior chamber was occupied by a blood clot and the iris could not be seen. The cornea was intact, but hazy; the wound was closed by a plug composed of blood clot and lymph. The globe was soft. The eye was easily enucleated. There was no other wound in the sclera, the horn having pierced the anterior wall of the globe only.

The specimen was put in alcohol, where it remained undisturbed for three or four weeks. Upon bisecting it I was surprised to find that the crystalline lens was encysted outside of the sclera, and that, in making the section, I had divided it. It had evidently escaped from the scleral wound, slipped back between the ocular conjunctiva and the globe, and become encapsulated in a mass of inflammatory exudate.

AMERICAN OPHTHALMOLOGICAL SOCIETY.

[*Abstract Report.*]

NEW LONDON, JULY 20, 1898.

DR. GEO. C. HARLAN, OF PHILADELPHIA, IN THE CHAIR.

The following gentlemen were elected to membership: Drs. J. W. Ingalls, Brooklyn; Anton Coe, Washington; F. N. Lewis, and J. H. Claiborne, New York; W. L. Wood, Portland, Oregon; J. T. Carpenter, Jr., James Thorington, W C. Posey, C. L. Veasy, A. G. Thomson, and T. B. Schneideman Philadelphia.

Why the Proportion of Blind in the Country is Greater than in Large Cities. DR. LUCIEN HOWE, New York.

In the twenty-five largest cities of the United States the proportion of blind is with two exceptions smaller than in the States in which these cities are situated, or taking all the cities of over 50,000 inhabitants together, we find in them about 33 per cent. less blind than the average for the entire country.

Second—When we examine the different factors in the production of blindness, whether congenital or acquired, or under the latter class, whether due to traumatism, general disease, or to local diseases, we find these factors are all practically the same, or are made equal, in city and country with one exception—namely, ophthalmia of infancy.

Third—A rather extended inquiry concerning the habitual practice of physicians in country alms-houses, in hospitals and elsewhere in the State of New York, indicates that more attention is given to guarding against ophthalmia of infancy in the cities than in the country.

Fourth—This tendency to the habitual neglect, or habitual use of such prophylaxis tends to make a rapid difference in the distribution of the blind, estimated at possibly 14 to 1. It is at least the most apparent cause of this difference and probably accounts for the greater part of it.

Fifth—It follows from this apparently warrantable conclusion that if as great care were taken in general throughout the country as is given on the average in the cities to such prophylaxis, the number of blind in the United States would be decreased in a single generation by some few thousands.

While it is neither advisable nor possible to force by legislation any one method of preventive treatment upon physicians in private practice, it is the right and duty of the State to provide for children born in alms-houses the best treatment thus far known, and to require for them the use of the silver nitrate solution, or of some other prophylaxis which may in the future prove to be equally efficacious.

Report of the Committee on Resolutions Relating to Purulent Ophthalmia of Infancy.

After a full consideration of all the information at hand, including a detailed study of statistics, etc., the committee reported in favor of adopting the following resolution:

Resolved, That we approve of legislation which would result in the invariable use of this method in alms-houses, or of any other equally safe and efficient method, whereby the loss of vision from this disease would be lessened.

Some Unusual Tumors of the Eye and Orbit. Dr. C. S. Bull, New York.

Dr. Bull reported one case of sarcoma which was supposed to be due to an injury of the eye received at some previous time, and a second case in which the microscopic examination showed the appearance of tubercles but in which the clinical history of tuberculosis was negative.

Dr. H. Knapp (New York) stated that these cases were rare, but that he had seen two cases where the origin of sarcoma from trauma was not problematic, but followed the injury at once.

Dr. T. Pooley (New York) reported a case in which a supposed sarcoma of the orbit had been removed and later examination showed it to be a tuberculous tumor of the lachrymal gland. The patient was a strong healthy individual without any history of tuberculosis.

Osteoma of the Orbit With Enophthalmus. DR. E. FRIEDENBERG, New York.

The two features of interest in this tumor were, first, the position of the tumor, which was located located much more towards the temporal aspect of the orbit than usual, the mass of the osteoma being about at the center of the upper orbital margin, and secondly, the position of the eye, which was crowded backward into the orbit and slightly downwards, in other words, there was enophthalmus instead of the customary exophthalmus. The tumor with the anterior wall of the sinus was chiseled away and the patient made a good recovery, though the eye remains still slightly lower than its fellow. Vision of $^{22}/_{C}$ was improved to $^{20}/_{L}$ by the use of glasses; the Javal ophthalmometer showing the presence of 8 D. astigmatism, which was corrected by $+4$ D. cyl. ax. 90° $\frown$ -4 D. cyl. ax. 180°.

Abscess Involving the Frontal Sinus With Destruction of the Vault of the Orbit and Depression of the Eyeball. DR. C. F. CLARK, Columbus, Ohio.

This abscess seemed to occur as the result of traumatism, the patient having received a blow in the face about a year previously, and having suffered more or less continuously with headaches and other symptoms that might be attributed to abscess in the sinus. The bone had been eroded to such an extent that the brain cavity was invaded, and the depression of the eye was sufficient to produce a hyperphoria of the opposite side equal to $5^{1}/_{2}°$. The patient did well after operation, but the wound has not thoroughly healed, probably because of the presence of some sequestra.

During the year before she came for treatment she would occasionally have attacks of pain followed by discharge of mucus and pus from the nose and mouth, and she noticed that at such times the size of the swelling of the orbit diminished. Pressure over the swelling met with such firm resistance that it was at first suspected that the condition was produced by an osteo-sarcoma.

A Large Tumor of the Orbit (Fibro-Sarcoma) of Twenty Years' Standing; Removal. DR. F. M. WILSON, Bridgeport, Conn.

DR. WILSON exhibited this pathological specimen, which was of immense size for an orbital tumor. The patient had had the power of opening the lids, but could not close them over the tumor except by taking hold of the free border of the upper lid and pulling it out. The tumor had existed for a remarkably long time and there were conflicting opinions as to the advisability of an operation. The operation seems so far to have been a success. Although the eye was so displaced that the cornea was 1 1/4 inches in front of the orbit, motility of the iris and some vision had been retained.

DR. POOLEY remarked that in New York a tumor seldom got the opportunity to grow to such a size. He had seen the case previously and advised operation.

A case of Lipoma of the Orbit. DR. EMIL GRUENING, New York.

DR. GRUENING referred to the very great rarity of lipomas of the orbit, and then reported his case which occurred in a young man. It was a lobulated tumor about the size of a lima bean, and microscopic examination showed nothing but fat cells. The author stated that most tumors of this class that been had heretofore reported were sub-conjunctival tumors.

DR. HOLDEN stated that the more we examine tumors of the orbit the more surprised are we at the great variety that occur there. He referred to one 1 1/3 inches in length by 3/4 of an inch in width, two-thirds of which was purely lipoma, a small portion angioma, and one end of it distinctly fibromatous, and said that the association of these three variations was not uncommon.

DR. H. KNAPP reported a case parallel with Dr. Gruening's, in which the tumor was partially encapsulated and was so large as to necessitate its removal in three sections at three different operations.

The Treatment of Entropion of the Lower Lid With Caustic Potash. DR. SAMUEL THEOBALD, Baltimore. (See next No.)

In applying this method the aim should be to produce a

scar 3 to 4 mm. wide, parallel with the lid margin and extending the whole length of the tarsus. The action of the caustic should not be allowed to approach nearer the edge of the lid than $1^1/_2$ to 2 mm. When the requisite effect has been produced the caustic action is checked by the application of vinegar diluted with an equal quantity of water, or a solution of acetic acid of about the same strength. The eschar soon begins to contract and the lid, which up to this time has been held in an everted position, no longer shows an inclination to turn in. It is seldom necessary to repeat the operation, but it can be done if necessary.

Dr. Thcobald thought the treatment especially applicable to senile entropion, but useful also in other varieties. Better results, it was thought, could be obtained by the use of the caustic than by the knife and no other anæsthesia is necessary than the local application (on cotton) of cocaine.

Dr. Knapp thanked Dr. Theobald for his paper and said that senile entropion had vexed him considerably. He had employed a number of operations but without equal or satisfactory success. He thought the method proposed was more thorough and better adapted to the purpose than the actual cautery.

Dr. Abbott asked why soaking the lids with cocaine was considered preferable to its hypodermic use.

Dr. Theobald replied that he did not specially prefer it, but had not found the hypodermic necessary. He referred also to some cases in which the other operations had been performed without success and in which the caustic potash accomplished the desired result.

Dr. Gruening stated that he had found an operation similar to Hotz's method entirely satisfactory.

Dr. Noyes stated that he used a similar operation, but removed a narrow strip of skin and inserted deep sutures into the orbital tissue.

Lymphoma of the Lids. Dr. Myles Standish, Boston.

Dr. Standish reported a lymphomatous growth in the lower lid close to, but not involving, the lachrymal sac. The administration of arsenic had resulted in its cure.

Dr. De Schweinitz referred to a number of lymphomas

and sarcomas that had been favorably treated with preparations of arsenic and stated that while we must not depend entirely upon the administration of arsenic in morbid growths there are a sufficient number of cases improved by its use to show that we must be careful about operating simply upon the clinical diagnosis of these tumors.

A case of Spindle-Cell Sarcoma Involving the Conjunctiva and Cornea; Removal of Growth Without Impairment of Sight. DR. S. B. ST. JOHN, Hartford.

The patient was a man, aged 72 years, who had lost the right eye twelve years previously as the result of traumatism. The growth appeared upon the left eye and grew in two and a half months from the size of a pinhead to that of a large pea. It sprang from the conjunctiva, was movable with that tissue, and overlapped the cornea. It was removed much after the fashion of a pterygium operation.

Conjunctival Melano-Sarcoma Involving the Cornea. DRS. JOHN GREEN and A. E. EWING, St. Louis.

The tumor was a true melano-sarcoma involving the tissues above named to such an extent and was of such a size that it became necessary to enucleate the eye.

Hypopyon Keratitis, Break in Descemet's Membrane; Preceding Perforation Fluorescine Passed Throngh the Ulcer Into the Anterior Chamber. DRS. JOHN GREEN and A. E. EWING, St. Louis.

A case of traumatic ulcer of the cornea was reported in which hypopyon of 5 mm. in height occurred The treatment which Dr. Ewing followed with good result was the free use of hydrogen peroxide solution of normal strength, applied on a little mop to the surface of the ulcer, held there, and the application renewed a half dozen times until cessation of the ebulition had taken place. On using this application bubbles of gas would appear in the anterior chamber, but this was rapidly absorbed and in a few hours nothing remained of it.

Fluorescine produced its characteristic reaction. The hydrogen peroxide seemed to have the effect of breaking up the hypopyon mass and producing the good results that occurred.

The conclusions are that one source of hypopyon keratitis is through a direct break in Descemet's membrane, or by exudation from the iris, or thirdly, possibly from the epithelium of Descemet's membrane.

DR. HOLDEN opposed the idea that the hypopyon could come from the cornea, and cited Elschnig's recent experiments to prove that just the reverse happened, and that the pus cells found in the cornea had gotten there secondarily. He believes that the break in Descemet's membrane always begins with changes on its posterior surface.

A Case of Interstitial Keratitis Congenital in Origin. DR. H. F. HANSELL, Philadelphia.

The patient was first seen when only 36 hours old and presented these symptoms: A thin watery discharge from the eyes, lids slightly swollen and bluish-red in color, conjunctiva smooth, but the ocular portion distended from the fornix to the limbus of the cornea by an almost transparent effusion. The cornea showed, on inspection a gray infiltration of the deep layers consisting of fine points that tended to become confluent, most dense over the pupil, without vascularity or loss of epithelium. The child was poorly nourished, probably because of the fact that the mother, though ordinarily a healthy woman, had been in bad health throughout the pregnancy. There was no history of specific disease. The child was given tonic treatment, and at the end of six weeks there remained only a slight opacity of the right eye. The local treatment consisted of the application of mydriatics. A similar case was referred to which was reported by Barnacheff, in which the cornea became entirely clear.

New Treatment of Ulcers and Other Infectious Diseases of the Eye by Cassareep. DR. S. D. RISLEY, Philadelphia.

This preparation is made from the juice of the black cassava, was introduced here by Dr. Chandler, and is used in a 10 per cent. ointment. It is applied freely between the lids and

the eye subjected to massage to distribute it, and in the corneal cases the protecting bandage applied. It causes no irritation and rapidly produces improvement.

DR. JOHN GREEN stated that he had seen the natives making cassava bread, and that amongst them the juice had the reputation of being preservative to the flesh.

DR. MYLES STANDISH had been using the preparation since Dr. Chandler originally introduced it and thought that in cases of corneal ulcers, if the ointment be used for some time after healing has occurred, the scar is less dense than if treated by other means.

DR. JACK had used the preparation, but said that in some cases it had been rather irritating.

DR. RISLEY stated that he had not noticed any difference in the degree of opacity as compared with other methods of treatment, but believed that that would depend rather upon the amount of tissue destroyed.

AFTERNOON SESSION.

Spontaneous Expulsion of a Foreign Body From the Anterior Chamber. DR. J. P. WORRELL, Terre Haute.

The patient was a boy who had received an injury of the right eye while exploding a gun-cap by striking it with a hammer. After the inflammation had cleared up a small piece of bright metal could be seen on the inner surface of the cornea. The patient declined operation for its removal, and some days later appeared with the statement that, "feeling something scratching the eye he rubbed it with a bit of cotton and removed, with some secretion, a small piece of bright copper." No inflammatory trouble followed.

DR. HANSELL reported a case where a piece of steel had been in the anterior chamber, according to the patient's story, fifteen years, and was spontaneously extruded.

Some of the Earlier Symptoms of Senile Cataract. DR. W. F. MITTENDORF, New York.

DR. MITTENDORF has carefully observed the last 508 cases of incipient senile cataract that have appeared in his practice

in order to determine the exact location of the first changes in the transparency of the lens. Of these 106 were central and 402 peripheral, and of the latter the starting point of the striæ was found in the upper periphery in 13 cases only, in the outer periphery in 47, in the general periphery 48, and the greatest number, 286 cases, in the lower and inner quadrant. Admitting that cataractous changes do not depend upon senility alone, but more particularly upon the nutrition of the lens, Dr. Mittendorf offers as a possible reason for the great prevalence of opacities in the lower inner quadrant the theory that there is a constant accommodation for small objects, especially reading by artificial light, requiring a more or less forced convergence and a downward look, during which the pressure upon the surrounding tissues is an impediment to the nutrition of this particular portion of the lens.

DR. RISLEY thought that these opacities in the lower and inner periphery of the lens are often associated with choroidal disturbances in that section. He had noticed it particularly among iron workers where it seemed to be due to the heat to which they are subjected, this being the least protected portion of the eye.

The Operations for Secondary Cataract. DR. H. KNAPP, New York.

DR. KNAPP reports a very interesting case of secondary cataract operation. The primary operation for removal of the cataract was without special interest. The capsule becoming cloudy and necessitating a secondary operation, it was needled in the ordinary way. The immediate result was good, but two days later reaction occurred and a severe, acute glaucoma set in. An iridectomy was at once attempted, but it was found impossible to catch hold of the iris so the operation was abandoned. The patient was relieved, however, of all pain and discomfort as a result of the paracentesis and remained so for four days when trouble again set in. A second attempt at iridectomy was made and this time successfully. The relief was permanent.

Dr. Knapp then gave a tabulated report of 70 cases of secondary cataract operated upon since October, 1897. Sight was improved in 63, remained the same in 6, and was almost

lost in 1. Two cases besides the one quoted above were complicated by glaucoma, one of them being relieved by myotics and the other by an iridectomy.

Considering the advisability of operating in cases that have vision not below $^{20}/_{LXX}$, the author says that it must depend upon the case, but that ordinarily he believes we should attempt to give the patient the best sight his eye is capable of, especially as the secondary operations, rare accidents excepted, are safe.

He considers discision the proper operation and lays down as a rule of paramount importance "cut, don't tear." As the region of the wound made in the primary extraction is the weak point in these eyes he considers it advisable to avoid that region as much as possible in the secondary operation and a T-shaped incision in the capsule is thought to be best, the horizontal arm of the T being situated below the linear scar, which Dr. Knapp makes in the capsule when extracting.

DR. ROOSA advocated the plan of removing the capsule in the secondary operation instead of doing a discision.

DR. NOYES preferred the discision and stated that he had occasionally introduced a long needle through the sclera, because it gave a better leverage when cutting the capsule. Occasionally he had used a second needle passed through the cornea at the same time.

DR. C. J. KIPP referred to the difficulties encountered in attempting to remove the capsule.

DR. CALLAN stated that he found himself more and more inclined to the use of the DeWecker scissors.

DR. POOLEY thought that all the operations, other than discision with a sharp needle knife, were open to serious objections.

DR. KNAPP thought that discision is by far the safest operation and is indicated it at least 95 per cent. of cases.

Delayed Union After Cataract Extraction. DR. GEO. C. HARLAN, Philadelphia.

DR. HARLAN reports two more cases of delayed union after cataract operations, in one of which union took place somewhere between the tenth and seventeenth days and in the other at the end of twenty days. By a review of the literature

he found 26 similar cases in which the delay had lasted from five to twenty days. In 20 of these cases no cause could be given for the wounds having remained open. He states that such cases seem to require no special treatment other than atropia and slight pressure bandage, together with treatment of any complications that may arise.

DR. NOYES had had such a case in a gentleman over 70 years of age, where the wound failed to unite for over a fortnight, the edges of the wound being actually inclined to eversion. The wound finally healed and the man enjoyed good vision for ten years.

DR. GRUENING believed that one cause of the delay might be that the operation had been done within the clear cornea and thinks that he gets most rapid healing when he makes a conjunctival flap.

THURSDAY, JULY 21.

Protargol in the Antiseptic Preparation of the Conjunctiva Prior to Cutting Operations on the Eyeball. DR. B. E. FRYER, Kansas City, Mo.

DR. FRYER uses a 2 per cent. solution of protargol as an antiseptic and finds it preferable to solutions of bichloride, etc. It is destructive of all organisms and is not irritating.

Buphthalmia—An Interesting Series of Cases Occurring in the Same Family. DR. WALTER B. JOHNSON, Patterson, N. J.

Three children in one family were found buphthalmic within the first few years of life. Ophthalmic examinations were not satisfactory. Two of the children were operated upon in Naples and the third here by Dr. Johnson. In every case the progress of the disease was arrested. The mother's eyes were normal, but the father thought he had never seen out of one eye, in which a disintegrated calcarious lens prevented a fundus examination.

DR. HARLAN recalled the statement of Mauthner made some some years ago that buphthalmia is simply congenital glaucoma.

Contribution to the Pathology of the Eye and Its Appendages. Dr. G. E. De Schweinitz, Philadelphia.

Case 1.—Primary carcinoma of the caruncle. A small growth entirely replacing the right caruncle, about the size of an ordinary pea, and which had existed for a number of years. Microscopic examination proved it to be carcinomatous. So far as known there has been no recurrence.

Case 2.—Prelachrymal growth with the histological characters of tubercle. A small tumor anterior to the lachrymal sac was discovered while probing the tear-duct. It was easily removed, and on examination showed the appearance of tubercle, although no tubercle bacilli could be found.

Case 3.—Angioma of the lachrymal gland extending to the apex of the orbit; removal with preservation of the globe, functions of the eyeball and of the external ocular muscles with the exception of the levator which was involved in the growth. This tumor, which is exceedingly rare, consisted of an angiomatous growth involving the lachrymal gland and extended deep into the orbit. It was probably congenital. In front of the ear, on the same side, there was a small cavernous angioma about one and a half inches in length and one inch in width, but not communicating with the growth of the lids.

Dr. Fryer asked if, in the examination of the carcinoma, coxidia had been found.

Dr. De Schweinitz said that he believed that there was considerable mythology connected with the pathology of coxidia.

Dr. Bull reported a similar case of prelachrymal growth which had been removed on the supposition that it was a cyst.

Remarks on Cases of High Myopia; Treatment of One Case by Removal of the Crystalline Lens. Dr. H. D. Noyes, New York.

The interesting features of this case are: the early occurrence of convergent squint; that a rapid development of myopia occurred between 6 and 8 years of age; that the removal of the lens produced a change of 16 D. and with it an improvement of vision to double the previous condition; that binocular vision was not secured by the refractive changes and that diplopia was never observed.

Contribution to the Operative Treatment of High Myopia, With Report of an Additional Case. DR. W. H. WILMER, Washington.

In the case reported by Dr. Wilmer the operation decreased the myopia by 22.5 D., and the vision was double what it had been before operating. In regard to the mode of operation the author preferred a slight discision, making a very small opening in the anterior capsule, followed by extraction within six days. As to the amount of myopia which offers the best operative result, he considers the ideal case to be the one wherein two or three dioptres of myopia would remain after the operation. According to his experience, this would mean a myopia of twenty-five dioptres.

DR. NOYES believed that if the operation were limited to cases of this degree the amount of choroidal trouble would be so great as to incur great risks in the operation. He believes that we are justified in operating in young subjects with 13 D. or more of myopia if the fundus is in good condition.

The Pathology of Experimental Quinine Amblyopia. DR. WARD A. HOLDEN, New York.

DR. HOLDEN'S experiments were made with the aid of the newer stains for nerve tissues and he exhibited drawings showing the changes that exist at various stages of the quinine poisoning.

The first changes were shown in the breaking down of the ganglionic cell bodies and a deposition of myeline-like substance in the nerve fibers. This appeared within three days after administration of toxic doses. From that time until the seventeenth day more ganglion cells were destroyed and at that time the changes in the optic nerve consisting of a breaking down of the medullary sheaths of the fibers was noticed. By the forty-second day the ganglion cells and the nerve fiber layer had almost entirely disappeared and the degeneration could be traced up to the external geniculate body and pulvinar. No signs of degeneration could be found elsewhere in the brain or cord.

Two Cases of Premature Delivery to Preserve Sight. DR. A. E. ADAMS, Newberg.

DR. ADAMS reports two cases of albuminuric neuro-retini-

tis occurring in pregnant women, with vision reduced to a very low point. Shortly after premature delivery the vision showed marked improvement, and the author concludes that if abortion is ever justifiable it is in these cases, especially as the uræmic condition of the blood is dangerous to the life of the fœtus as well as a menace to the mother.

Implantation of Sponge in the Orbit After Enucleation. Dr. S. B. Risley, Philadelphia.

A fragment of surgeon's sponge, carefully sterilized, was pared down to a size just sufficient to fill loosely the cavity left by the removal of the ball and to permit the suturing of the conjunctiva and the sub-conjunctival tissue over it without undue tension.

The design was to furnish a frame work for the deposition of connective tissue in the orbit and thus avoid the concaved socket which follows enucleation, and always permits the accumulation of tears and mucus behind the artificial eye. After the operation the appearance was much the same as that presented after the insertion of a glass globe as in the Mules' operation. Two or three months is required to complete the process of absorption of the sponge and the deposition of new tissue.

Exhibition of Chalazion Forceps. Dr. C. J. Kipp, Newark.

These consisted of a simple forceps, one blade of which was solid, and the other contained a slit, so that when this blade is placed over the conjuctival surface of the chalazion the latter may be incised through the slit and its contents squeezed out by pressure.

It is with sincere regret that we hear of the death of Dr. T. E. Murrell, formerly of this city, at Denver, Colorado, from pulmonary hæmorrhage.

At the Denver meeting of the American Medical Assosociation, Dr. Casey Wood of Chicago, was elected Chairman, and Dr. C. H. Williams, of Boston, Secretary of the Ophthalmological Section.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

H. R. SWANZY, F.R.C.S.I., President, in the Chair.

FRIDAY, JULY 8, 1898.

Subconjunctival Bloodletting for Hæmorrhagic Retinitis.—MR. RICHARDSON CROSS read this paper. Recognizing the fact that a considerable amount of blood escaped from the wounded vessels in squint and other subconjunctival operations without any ill-effect, the author determined to try the effect upon intra-ocular hæmorrhage or congestion of a more or less free division of the blood vessels running along the muscles and in the subconjunctival tissue. For this purpose he made free incisions beneath the conjunctiva either between the inferior and internal recti, or between the superior and external recti; the incisions were followed by the use of hot fomentations. From the result of this kind of interference in several cases, the author felt justified in recommending this plan of abstracting blood from the branches of the ophthalmic artery. In one case in which there were numerous retinal hæmorrhages round the disc, with much congestion of the retinal vessels, and some optic neuritis, leeches and general medical treatment had been applied without benefit, and V. was reduced to $^{6}/_{LX}$. Free incisions were made into the subconjunctival tissue with strabismus scissors so as to lacerate as many vessels as possible, and warm fomentations were afterwards applied. The next day the pupil was dilated, and there was marked diminution in the swelling of the disc, with an improvement in vision. This improvement was steadily maintained, and the vision was eventually completely restored. Several other cases were quoted in which considerable improvement resulted.

The Mechanism of the Conjugate Movements of the Eyelids.—DR. ALDREN TURNER read this paper. He showed that there was accumulating evidence in favor of the sixth nerve nucleus being the lower or pontine center for the associated action of the internal and external recti muscles; and that the fibers from the sixth nucleus of one side probably passed directly into the third nerve of the opposite side, without the intervention of cells in the third nucleus, facts which indicated

that the internal recti were doubly innervated; on the one hand, from the third nucleus for convergence, and on the other from the sixth nucleus, for lateral movement. Respecting the path by which impressions were conveyed from the cerebral cortex to the sixth nucleus, he referred to an experiment in which the tegment of the pons was divided without interference with the sixth nucleus. As a result, conjugate deviat on of both eyes to the opposite side, with inability to move them to the side of lesion, was observed. The conclusion drawn from this observation was that the cortico-pontine fibers decussated in the neighborhood of the quadrigeminal bodies, and passed downwards in the tegment of the pons to the sixth nucleus.

THE PRESIDENT made some observations on the position of the nuclear center for convergence, and on the probability of there being not one but several cortical centers for conjugate movements of the eyes.

MR. JESSOP thought that absence of convergence power was a very rare condition; he knew of only one case, in a boy subject to epileptic fits. He had advanced both internal recti, with the result that the boy now had several meter angles of positive convergent power.

In reply, DR. TURNER stated that he had only seen one case of paralysis of convergence, while the conjugate movements were unaffected. He referred to the loss of pupillary contraction on attempts at convergence in that case, while the pupillary light reflex was retained. This phenomenon was the converse of the Argyll–Robertson pupil.

Large Clear Cyst of the Conjunctiva.—MR. SIMEON SNELL (Sheffield) related particulars of this case. The cyst was as large as a hazel nut; it was concealed almost entirely by the lower eyelid, but when the lid was drawn down it bulged forward. The patient was 23 years of age; the cyst had been noticed since childhood but was then quite small. Ten months before coming under observation he was struck over the cyst, which enlarged and became bluish in color; before this it was transparent. Microscopical examination of the cyst made by Mr. Treacher Collins showed it to be lined throughout by a single layer of endothelial cells, outside which was some moderately dense fibrous tissue with patches of round-celled infiltration in it. The cyst was probably lymphatic in origin.

Chancre of the Lachrymal Sac.—Mr. Simeon Snell related this case. The patient sought advice for what he deemed subacute inflammation of the lachrymal sac. When seen there was no ulceration of the sac but there was a more than usual defined margin to the swelling. There was nothing to suggest a primary lesion. Later the canaliculus was slit up and the duct probed with some slight relief; afterwards a macular syphilide appeared on the chest and arms with ulceration of the tonsils. Presuming the lesion of the lachrymal sac to be a primary sore, the secondaries appeared in correct sequence as to time, the first swelling of the sac being noticed on April 3, and the rash appeared on May 13. The thickening of the sac and the rash quickly dispersed under mercurial treatment.

Card Specimens.—The following were the card specimens:

Mr. Richardson Cross: Plastic Operation for Contracted Socket.

Mr. Ernest Clarke: Pipmented Mole of Face and Eyelids.

Mr. Adams Frost: Case of Pseudo-Glioma.

Mr. Marcus Gunn: Preparation of a Sclerosed Retinal Artery.

PAMPHLETS RECEIVED.

"Diseases of the Lachrymal Passages; Their Causes and Management," by L. Connor, M.D.

"The Prevention of Diseases Now Preying Upon the Medical Profession," by L. Connor, M.D.

"The Form of the Source of Illumination (Illuminated Square) for Skiascopy," etc., by A. Antonelli, M.D.

"The Importance of the Early Recognition and Treatment of Inflammatory Glaucoma," by C. A. Veasey, M.D.

"Pathological Report on the Eyes of Dr. Hirsch's Patient With Amaurotic Family History," by W. A. Holden, M.D.

"The Employment of Solutions of Toluidin-Blue as Collyria and as a Stain for Corneal Abrasions and Ulcers," by C. A. Veasey, M.D.

"Report of a Case of Acute Glaucoma Complicated by Cataractous Formation of Lens and Anterior Dislocation of Same. Complete Recovery Without Operative Interference," by S. P. Eagleton, M.D.